Review

Multidrug Resistant Tuberculosis (MDR-TB) Factors: Literature Review

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| ARTICLE INFO	ABSTRACT
Article History Submit : Nov 15, 2023 Revised : Dec 22, 2023 Accepted : Dec 25, 2023 **Keywords:** MDR TB, Multidrug Resistant, Tuberculosis.	*Background: Multidrug-resistant tuberculosis (MDRTB) is the biggest problem in preventing and eradicating TB in the world. MDR-TB occurs if the tuberculosis germs are resistant to various first-line OAT, at least two drugs, namely isoniazid and rifampicin. The emergence of MDR-TB cases presents new obstacles and challenges to the effectiveness of TB control programs due to difficult diagnosis, high rates of therapy failure, and death. This literature review aims to determine the factors that cause multidrug-resistant tuberculosis (MDR-TB).* *Methods: The method used in this article is a literature review using journal databases from Pubmed and Google Scholar in the 2020-2023 time period with the keywords "drug MDR TB," "multi-drug TB MDR factors," "TB MDR," and " resistant TB medicine" found in 1,990 articles, 304 from Pubmed, and 1,960 from Google Scholar). Articles were selected according to the criteria, and the result was 20 articles ready to be reviewed* *Results: The results of this study show that risk factors have been proven to show that there is a significant relationship between history of diabetes mellitus, history of TB treatment, patient motivation, adherence to taking medication, duration of TB treatment, status of drug side effects, employment, marital status, economic level, history of contact with patients. MDR TB, stress level, and family support are related to the incidence of MDR TB* *Conclusion: The conclusion of the 20 articles reviewed shows that age, gender, compliance with taking medication, diabetes mellitus, and a history of contact with MDR TB patients are the factors that most influence the occurrence of MDR TB*

Introduction

Tuberculosis (TB) is a chronic infectious disease due to infection with Mycobacterium tuberculosis (M. tuberculosis), an acid-resistant bacillus-shaped bacterium. Tuberculosis is an infectious disease that is the main cause of death throughout the world. Before the COVID-19 pandemic, Tuberculosis ranked first in terms of the highest number of deaths due to infectious diseases, even surpassing AIDS. The World Health Organization (WHO) estimates that there will be around 10 million TB sufferers

worldwide in 2020 (World Health Organization, 2021)..

Multidrug-resistant tuberculosis (MDRTB) is the biggest problem in preventing and eradicating TB in the world. MDR-TB occurs if the tuberculosis germs are resistant to various first-line OAT, at least two drugs, namely isoniazid and rifampicin (Geiger et al., 2021; Groenweghe et al., 2023; XU et al., 2023) The emergence of MDR-TB cases presents new obstacles and challenges to the effectiveness of TB control programs due to difficult diagnosis, high rates of therapy failure, and death. This is because the treatment required is more expensive and takes a longer period (Feng et al., 2019; Sherwood, 2014; Siddique et al., 2019)Even though the number of TB sufferers has decreased significantly over the last two decades, this infectious disease still exists and is one of the main health problems in the world, especially in Asia and Africa. Right now, we are faced with a quite worrying phenomenon, namely the emergence of cases of anti-TB drug resistance (OAT). OAT resistance is a condition where administering OAT can no longer kill M. tuberculosis germs.

Drug-resistant tuberculosis is a public health threat. Resistance to isoniazid (H) and rifampicin (R) – the two most powerful OAT regimens – known as Multidrug-Resistant Tuberculosis (MDR-TB) has become a major concern in controlling TB cases. Patients with MDR-TB cannot be cured with first-line OAT regimens (Jiang et al., 2023; Mbona et al., 2023; Santos et al., 2022) Worse treatment outcomes, high mortality rates, longer duration of treatment (approximately two years), high costs, and various other complications make the treatment of MDR-TB more complex compared to drug-sensitive TB (Li et al., 2022; Trubnikov et al., 2021; Usmanova et al., 2021).

Globally, in 2020, there were 157,903 cases of OAT resistance consisting of 132,222 cases of MDR-TB and 25,681 cases of XDR-TB (Extensive Drug Resistant Tuberculosis). In Indonesia, data from the Indonesian Ministry of Health in 2021 shows 8,268 MDR-TB patients (Kemenkes RI, 2022). The occurrence of MDR-TB involves many factors, such as a history of TB treatment, the patient's minimal knowledge of the disease, and poor adherence to taking medication. In addition, many new cases of MDR-TB are caused by errors in previous TB management, which include administering OAT regimens or monotherapy that are ineffective and at inappropriate doses, unclear doctor's instructions, lack of role of Drug Swallowing Supervisor, and failure to identify pre-existing resistance (Sherwood, 2014). Other risk factors for MDR-TB are a history of diabetes mellitus, HIV-AIDS infection, education level, place of residence, gender, age group, alcohol consumption, and nutritional status. 5-13 Identifying risk factors for MDR-TB is very important. It can help in developing appropriate case-finding strategies and optimal promotive-preventive efforts (Kurniawan et al., 2021; Kusmiati & Aini, 2021; Siwele et al., 2019).

Methods

This article uses the *literature review method*. The article search was carried out in September 2023 using Pubmed and Google Scholar journal databases. A systematic search for journal articles was carried out from the last three years, namely 2020-2023, with search keywords, namely " *drug TB MDR, "*multi-drug *factors TB MDR, "TB MDR,*" and "drug-resistant *TB* " to search for relevant articles. Researchers will screen the articles from the selected references without exception based on the title and abstract so that they get more and more relevant articles.

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The inclusion criteria for this *systematic review* are 1) Respondents are TB patients, 2) Focus on factors that trigger TB and MDR TB, and 3) Selection of articles is not limited to methodology, population, and results. Meanwhile, the exclusion criteria for this *systematic review* are 1) Research that is not related to TB and MDR TB without treatment, 2) Research that was not conducted on TB patients, 3) Unpublished research such as final scientific work (thesis, thesis, dissertation), conference abstracts, and case reports.

Articles that have been obtained from the database will be assessed using the PICO method by the inclusion and exclusion criteria; the money contains 1) the Title of the article, 2) the Author and year of publication of the article, 3) the Research methodology (population, sample, intervention, and analysis) 4) Research results.
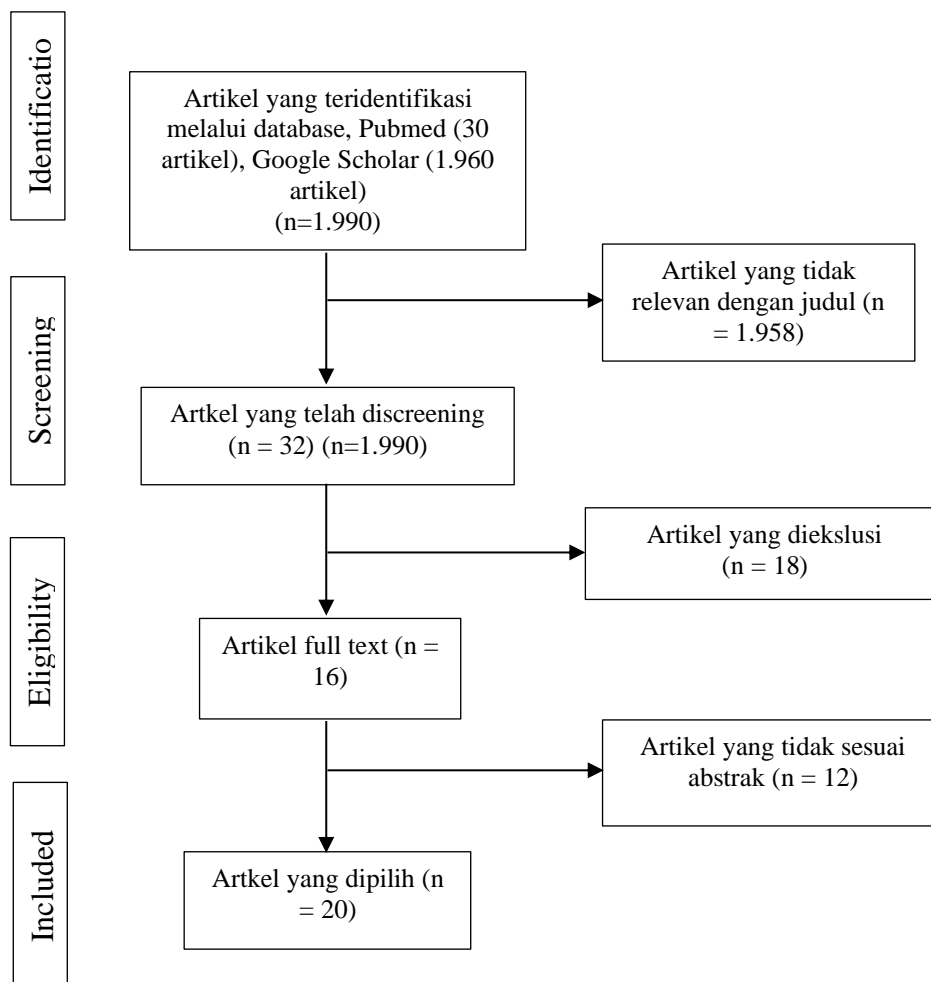
Results

Figure 1. Literature Search Flow Diagram

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Table 1. Data Distraction Method

No.	Title, Author, and Year of Article Publication	Research Methodology	Research result
1.	Multidrug Resistant Tuberculosis (MDR-TB) (Tri Wahyuni, 2020).	Design: analytical observational with case-control research design Subjects: 33 cases and 33 controls Variables: patient motivation, previous treatment history, compliance with taking medication, duration of TB treatment, status of drug side effects, incidence of MDR TB Instrument: Questionnaire Analysis: chi-square test	The most dominant factor in the incidence of MDR TB is a history of previous treatment. Research suggestions are given to related parties to participate in efforts to prevent and transmit MDR TB in Semarang City.
2.	Risk Factors Associated with the Incident of Multidrug-Resistant Tuberculosis (MDR-TB) in Ternate City, North Maluku. (Tri Wahyuni, 2020).	Design: analytical observational case-control design Subjects: 64 patients Variables: gender, age, education level, history of AIDS, the incidence of MDR-TB Instrument: medical record Analysis: multiple logistic regression)	There are two risk factors associated with the incidence of MDR-TB in Ternate City, namely, a history of diabetes mellitus and a history of TB treatment.
3.	Risk factors for the incidence of tuberculosis in children at Toto Kabila Hospital (Tantri Muharam, 2023). .	Design: quantitative descriptive with case-control study design Subjects: 30 people Variables: parental knowledge, BCG immunization history, and family smoking history are at risk of tuberculosis Instrument: Questionnaire Analysis: chi-square	There is an influence of parental knowledge, BCG immunization history, and family smoking history on the risk of tuberculosis in children.
4.	Characteristics of Multidrug-Resistant Tuberculosis Patients Treated in the Pulmonary Ward of Dr. M. Djamil (Valencia Perdana Rizal, 2021)..	Design: descriptive Subjects: all MDR-TB patients at RSUP Dr. M. Djamil Padang Variables: age 25-34 years, male, working, former smoker, normal BMI, negative sputum BTA examination results, no family history of TB, main complaint is cough, suspect criteria 1, and has comorbidities Instrument: medical record data Analysis: categorical descriptive	The results of this study showed that 25.64% of patients were in the 25-34 year age group, 74.35% male patients, 66.66% working, 46.15% former smokers, 51.28% normal BMI, patients with 20.51% of sputum BTA tests were negative, 69.23% had no history of TB in the family, 69.23% had the main complaint of cough, 84.61% suspected criteria 1, and 76.92% had comorbidities.
5.	Description of the Causative Factors for Multidrug-Resistant Tuberculosis (Mdr-Tb) at Haji Adam Malik General Hospital, Medan (Lindawati et all, 2023)..	Design: descriptive Subjects: 27 people Variables: age, gender, education level, income, employment, medication adherence, knowledge, attitudes, stigma, smoking habits, PMO role, and medication side effects Instrument: Medical records Analysis: categorical descriptive	From the results of *the Wilcoxon t-test p-value* for the intervention group $(0.00) < (0.05)$, while in the *Mann-Whitney test,* the control group *p-value* $(0.00 < (0.05)$, it can be concluded that there is a difference between before and after progressive muscle relaxation. , and there was no difference in the control group.

No.	Title, Author, and Year of Article Publication	Research Methodology	Research result
6.	Factors That Influence Client Compliance with Treatment for Drug-resistant Tuberculosis (Priyo Purnomo As'hab, 2020).	Literature was carried out systematically through four databases, namely EBSCO Host, Clinical Key, SAGE Publication, and Science Direct, with limited articles published in 2015-2020. The keywords used in the literature search are "drug-resistant," AND "tuberculosis," AND "adherence," AND "success rate." Articles that have been found from the database must meet the inclusion criteria: (a) articles in English, (b) method qualitative, quantitative, method, literature review, and systematic review research, (c) articles published in journals in the 2015-2020 period, (e) journals can be accessed openly and are available in full text.	Factors influencing treatment compliance are disease severity, comorbidities, drug side effects, age, marital status, education, and financial condition.
7.	Risk Factors for the Incident of Multi-Drug Resistant Tuberculosis (MDR TB) in Surakarta, Central Java (Ratnasari, 2020)..	Design: analytical with case-control study design Subjects: 34 cases and 34 controls of TB patients Variables: age, gender, marital status, level of education, employment, treatment compliance, type of financing and perception of distance, incidence of multi-drug resistant tuberculosis Instrument: observation and recording of TB 01 form data and medical records of MDR TB patients Analysis: Chi-square	The results of the analysis showed that four independent variables were proven to have a significant effect as predictors of MDR-TB, namely employment [$p= 0.034$; OR 1.170 (0.390-3.512)]; marital status [$p = 0.033$; OR 0.864 (0.299-2.495)]; regularity of taking medication [$p = 0.038$; OR 2.097 (1.625-2.705)] and distance [$p = 0.046$; OR 0.316 (0.097-1.030)]—incidence of MDR TB.
8.	Risk Factors That Influence the Incidence of Tuberculosis with Multidrug-Resistant Tuberculosis (MDR-TB) at Ulin Regional Hospital, Banjarmasin (Aulia Mashidayanti, 2020).	Design: analytics Subjects: 17 Non-MDR TB patients Variables: knowledge, motivation, and regularity of taking medication, incidence of tuberculosis with multidrug-resistant tuberculosis Instrument: Questionnaire Analysis: Chi-Square test and Fisher Exact test	The results of this study show that the risk factor proven to influence the incidence of MDR-TB is the regularity of taking medication (p-value < 0.05).
9.	Factors that influence the incidence of MDR TB in Semarang City (Susi Buryanti, 2021)..	Design: analytical observational with case-control design Subjects: 35 cases and 35 controls of TB patients Variables: gender, age, economic level, education level, nutritional status, history of contact with MDR	This research shows that economic level variables, history of contact with MDR TB patients, treatment history, and stress level are variables related to the incidence of MDR TB in Semarang City. Meanwhile, the variables age,

No.	Title, Author, and Year of Article Publication	Research Methodology	Research result
		TB patients, treatment history, stress level and DM Instrument: Questionnaire Analysis: Chi-Square	gender, BMI, education level, and DM are variables that are not related to the incidence of MDR TB in Semarang City.
10.	Factors that influence the incidence of treatment withdrawal in Mdr/Rr TB cases in DKI Jakarta (Helmi Suryani Nasution, 2020).	Design: Retrospective cohort Subjects: 420 TB patients Variables: Sex, Sex, History of TB Treatment, HIV Status Instrument: E-TB Manager Analysis: Chi-Square	The bivariate analysis showed that age was statistically related to the incidence of treatment dropout in MDR/RR TB patients in DKI Jakarta. Meanwhile, the variables gender, treatment history, and HIV status were not statistically related to the incidence of treatment withdrawal.
11.	Factors Affecting Tuberculosis Multidrug Resistance (MDR TB) (Trivianto G. Bawonte, 2021).	Literature review. The research data used is literature taken from three databases, namely Google Scholar, PubMed, and Clinical Key. The keywords used in the literature search were "Factors" AND "MDR TB" for searches on Google Scholar and "factors" AND "MDR TB" for searches on PubMed and ClinicalKey. The inclusion criteria in this research were community populations suffering from Multidrug Resistance Tuberculosis (MDR TB), cross-sectional studies, and case-control studies. Publication year 2010-2020 and in Indonesian and English.	The results of this study indicate that risk factors are proven to influence the occurrence of (MDR TB). The conclusions of the 15 articles reviewed show that age, gender, irregularity in treatment, and adherence to taking medication are the factors that most influence the occurrence of MDR TB.
12.	Prevalence and Factors Associated with the Development of Multidrug-Resistant Tuberculosis in Medan City (Lubis, 2021).	Design: analytical descriptive with cross-sectional design Subjects: 28 TB patients Variables: history of previous OAT use, level of compliance, level of adherence to taking medication with motivation to take medication, smoking and alcohol consumption, incidence of multidrug-resistant tuberculosis Instrument: Questionnaire Analysis: Pearson correlation	There is a relationship between the history of previous OAT use and the patient's level of adherence to MDR TB, the level of adherence to taking medication with motivation to take medication, and vice versa. Meanwhile, daily habits such as smoking and alcohol consumption were not related to previous history of OAT use, the patient's level of adherence to MDR TB, level of adherence to taking medication, and motivation to take medication.
13.	Non-adherence to Anti-Tuberculosis Drug (OAT) Treatment with the Occurrence of Multi-Drug Resistant Tuberculosis (Tb Mdr): A Narrative Review (Nurjanah, 2023).	This research is a narrative review conducted in three databases, namely PubMed, Google Scholar, and ScienceDirect, from 2018-2023. Articles were selected based on inclusion and exclusion criteria. A total of 15 articles were obtained from the literature selection carried out. Five articles discuss the level of treatment non-	The level of patient non-compliance in taking anti-tuberculosis drugs in TB patients is still quite high. There are internal factors, external factors, and therapeutic factors that influence patient compliance in taking OAT, thereby increasing the risk of developing TB into MDR TB.

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		adherence in TB patients and six articles discuss the level of treatment non-adherence in MDR TB patients.	
14.	Relationship between Age and Gender with MDR TB (Marlin Sutrisna, 2022)	Design: analytical observational Subjects: 35 TB patients Variables: Age, Gender, incidence of MDR TB Instrument: checklist or secondary data Analysis: chi-square.	Age and gender are the factors related to the incidence of MDR TB in the Sun Room at RSUD Dr. M. Yunus Bengkulu.
15.	Relationship between Age and Gender with MDR TB (Tomita A, 2019) .	Design: Age and Gender Subject: Variables: Instrument: Analysis:	The application of therapy carried out for one week has been proven to reduce blood sugar levels.
16.	Factors Influencing the Incident of Multi-Drug Resistant Tuberculosis (Mdr Tb) in Tasikmalaya City (Karina, 2021).	Design: analytical with case-control design. Subjects: 129 TB patients Variables: history of alcohol consumption, history of smoking, contact with MDR TB, history of TB treatment, history of side effects of TB drugs, regularity of taking TB medication, the role of family support PMO, gender, age, education level, the incidence of multidrug-resistant tuberculosis (MDR TB) Instrument: Questionnaire Analysis: chi-square	The results of statistical tests using the chi-square test showed that the variables that were related were history of alcohol consumption and smoking history, MDR TB contact, history of TB treatment, history of side effects of TB drugs, regularity of taking TB medication, the role of PMO, family support. Unrelated variables are gender, age, and education level.
17.	Determinant Factors for the Occurrence of Multidrug Resistance in the Treatment of Pulmonary TB (MDR-TB) at the Regional General Hospital, dr. Zainoel Abidin (M. Rizal Fahlafi, 2022)	Design: analytical with a case-control approach Subjects: 74 TB patients Variables: Age, Gender, Education, Occupation, Income, Distance from Residence, Number of Rooms, Information, Dropout from Treatment, Traditional Treatment, Smoking, Side Effects of Treatment, History of DM, occurrence of MDR-TB Instruments: questionnaire and observation Analysis: logistic regression	The results of the study showed that variables that had significant values were as follows: work with the occurrence of MDR-TB, smoking with the occurrence of MDR-TB, side effects with the occurrence of MDR-TB, and history of diabetes with the occurrence of MDR-TB.
18.	Resilience Factors in Multi-Drug Resistance Tuberculosis Patients: Literature Review (M. Rizal Fahlafi, 2022).	Methods: This study aimed to present the results of previous research on tuberculosis patients' resilience in continuing their lives with conditions diagnosed with tuberculosis by conducting a Literature Review	It concluded that in MDR-TB patients, several determinants could influence the resilience of MDR-TB patients to resume their unresolved treatment. These factors are social support, positive emotions, self-esteem, and risk factors.

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No.	Title, Author, and Year of Article Publication	Research Methodology	Research result
19.	Scoping Review: Risk Factors Associated with Multidrug-Resistant Tuberculosis (MDR-TB) (Muhammad Daryl Fadhilah, 2020).	The Scoping Review method was taken from the Springer Link and Science Direct databases, with the type of article chosen as a primary study or original research article. Article screening was carried out using the PRISMA flowchart, and eligible articles were selected based on the PICOS criteria.	Risk factors related to Multidrug-Resistant Tuberculosis (MDR-TB) are the age group 15, −54 years, male, living in an urban area, and only having a history of elementary school (SD)/equivalent education or lower.
20.	Factors Associated with the Behavior of Mdr TB Patients in Preventing Mdr TB Transmission in the Semarang City Health Center Working Area (Asnia Uliya Devi, 2019).	Design: descriptive analytics with a cross-sectional study. Subjects: 45 TB patients Variables: knowledge, attitudes, accessibility of MDR TB information, family support, age, gender, highest level of education, employment, family income, accessibility to medication, supporting infrastructure to prevent transmission of MDR TB, social support, support from health workers (puskesmas staff), support from community leaders, support from friends. Instruments: questionnaire and observation Analysis: Chi-Square test	There is a relationship between knowledge about MDR TB, attitudes, accessibility of MDR TB information, family support, and prevention of MDR TB transmission. It is not related to age, gender, highest level of education, employment, family income, accessibility to medication, infrastructure to prevent MDR TB transmission, social support, support from health workers (puskesmas officers), support from community leaders, or support from friends.

Discussion

The results of the analysis of 20 journals that have been reviewed show that risk factors have been proven to show that there is a significant relationship between history of diabetes mellitus, history of TB treatment, patient motivation, adherence to taking medication, duration of TB treatment, status of drug side effects, employment, marital status, economic level, history of contact with MDR TB patients, stress level, smoking history, family support are related to the incidence of MDR TB.

Based on the research results, it was found that there was a significant relationship between the DM history variable and the incidence of MDR-TB (p=0.021). An OR value of 4.2 was also obtained, which means that TB patients with a history of DM had a 4.2 times greater risk of suffering from MDR-TB compared to those without a history of DM .

Based on the research results, it was found that there was a significant relationship between the TB treatment history variable and the incidence of MDR-TB (p=0.010). An OR value of 6.818 was also obtained, which means that TB patients with a history of TB treatment are almost seven times more likely to suffer from MDR-TB compared to those without a history of TB treatment (. Based on research results shows that eight people (24.2%) had a history of MDR TB sufferers who had previously failed treatment, seven people (21.2%) dropped out of treatment, and 13 people (39.4%) relapsed.), and five people (15.2%) have only recently or previously not received treatment. From the results of statistical tests, it is known that the previous treatment history variable has a p-

value of 0.0001 (<0.05), which means that there is a relationship between previous treatment history and the incidence of MDR TB. The OR for respondents with a history of previous failed treatment was 44.8, which means that these respondents had a 44.8 times risk of experiencing MDR TB compared to respondents who had not previously received treatment or were new. Previous treatment history of dropping out of treatment has an OR value of 39.2, which means that respondents who have dropped out of treatment have a 39.2 times risk of experiencing MDR TB compared to respondents who have not had previous treatment. Respondents with a history of previous treatment relapse had an OR value of 24.267, which means that these respondents had a 24.267 times risk of experiencing MDR TB compared to respondents who had not previously received treatment.

Based on the research results, it showed that 14 respondents (42.4%) of MDR TB sufferers had low motivation to carry out treatment, while 19 people (57.6%) had high motivation to carry out treatment. From the results of statistical tests, it is known that the patient motivation variable has a p-value of 0.013 (<0.05), which means there is a relationship between patient motivation and the incidence of MDR TB. The OR value is 5.342, meaning respondents with low motivation are 5.342 times more likely to experience MDR TB than respondents with high motivation.

The research results showed that 13 people (38.4%) of respondents in the case group were not compliant in taking medication. From the results of statistical tests, it is known that the medication adherence variable has a p-value of 0.010 (< 0.05), which means that there is a relationship between medication adherence and the incidence of MDR TB.

The OR value is 6.5, which means that respondents who are not compliant with treatment have a 6.5 times risk of developing MDR TB compared to. This can be interpreted as treatment adherence playing a vital role in determining the success of the TB treatment program. The incidence of MDR-TB is said to be a global problem that continues to increase from year to year, and one of the causes is patient non-compliance during the treatment program.

Research (Nuwa, 2018)Based on his research, 13 people (38.4%) of respondents in the case group were not compliant with taking medication. From the results of statistical tests, it is known that the medication adherence variable has a p-value of 0.010 (<0.05), which means there is a relationship between medication adherence and the incidence of MDR TB. The OR value is 6.5, which means that respondents who are not compliant with treatment have 6.5 times the risk of experiencing MDR TB compared to respondents who are compliant with treatment.

The research results showed that 18 respondents (54.5%) in the case group had a previous TB treatment duration of >6 months. From the results of statistical tests, it is known that the length of TB treatment variable has a p-value of 0.002 (<0.05), which means that there is a relationship between the length of TB treatment and the incidence of MDR TB.

Based on the research results, it shows that the majority of respondents, namely 24 people (72.7%) in the case group, experienced drug side effects, while nine people (27.3%) did not experience drug side effects. From the results of statistical tests, it is known that the drug side effect status variable has a p-value of 0.003 (<0.05), which means there is a relationship between drug side effect status and the

incidence of MDR TB. The OR value is 5.333, which means that respondents who experience OAT side effects are 5.333 times more likely to experience MDR TB than respondents who do not experience OAT side effects.

The bivariate and multivariate analysis results showed a significant relationship between the respondent's type of work and the incidence of MDR TB, with a p-value of 0.034 and an OR of 1.170 (0.390-3.512). Jobs are grouped into working and not working, influencing how much a person receives monthly. The respondents' types of work include seven alternative answer choices: civil servants/TNI/Polri, private sector employees, self-employed, farmers, laborers, traders, students, and homemakers.

The analysis results show a significant relationship between the patient's marital status and the incidence of MDR-TB, with a value of p=0.033 (0.05); 95% CI, odds ratio 0.864 (0.299- 2.495). This is by the statement that marriage is one factor that predicts TB with an AOR value = 1.5; 95% CI: 1.7, 13.03).

This study concluded that there was a relationship between economic level and the incidence of MDR TB in Semarang city health centers. This is based on analysis with the chi-square test, which obtained a p-value of 0.01 and OR 3.43. These results show that respondents with a low economic level are at 3.43 times greater risk of developing MDR TB disease than people with a high economic level.

Based on this research, the results showed a relationship between the history of contact with MDR TB patients and the incidence of MDR TB in Semarang city health centers. This is based on analysis with the chi-square test, which obtained a p-value <0.01 and OR 2.40. These results show that people with a history of contact with

MDR TB patients have a 2.4 times greater risk of developing MDR TB compared to people who have no history of contact with MDR TB patients (Nuwa, 2018)

Based on the research results, it was concluded that there was a relationship between stress levels and the incidence of MDR TB in Semarang city health centers. This is based on analysis with the chi-square test, which obtained a p-value of 0.01 and OR 4.58. These results show that people who experience stress have a 4.58 times greater risk of developing MDR TB compared to people who do not experience stress.

Based on research results, family support is related to the incidence of MDR TB; this is proven by research conducted. The results of statistical tests using the chi-square test show that the related variable is family support (p=0.043 and OR=10.833).

Conclusion

literature review shows that proven risk factors show that there is a significant relationship between history of diabetes mellitus, history of TB treatment, patient motivation, adherence to taking medication, duration of TB treatment, status of drug side effects, employment, marital status, economic level, history of contact with patients. MDR TB, stress level, smoking history, and family support are related to the incidence of MDR TB

Authors Contributions

The author carries out tasks from data collection, data analysis, making discussions to making manuscripts

Conflicts of Interest

There is no conflict of interest

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